



SEQUENCE LISTING

<110> Wild, Carl T.
Allaway, Graham P.

<120> A Method for Generating Immunogens that Elicit
Neutralizing Antibodies against Fusion-Active
Regions of HIV Envelope Proteins

<130> 1900.0260001

<140> US 09/189,981

<141> 2001-03-16

<150> US 60/189,981

<151> 2000-03-17

<160> 87

<170> PatentIn version 3.0

<210> 1

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 1

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 2

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 2

Tyr Thr Asn Thr Ile Tyr Thr Leu Leu Glu Glu Ser Gln Asn Gln Gln
1 5 10 15
Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30
Trp Asn Trp Phe
35

<210> 3

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 3

Tyr Thr Gly Ile Ile Tyr Asn Leu Leu Glu Glu Ser Gln Asn Gln Gln
1 5 10 15
Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Asn Leu
20 25 30
Trp Asn Trp Phe
35

<210> 4

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 4

Tyr Thr Ser Leu Ile Tyr Ser Leu Leu Glu Lys Ser Gln Ile Gln Gln
1 5 10 15
Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30
Trp Asn Trp Phe
35

<210> 5
 <211> 36
 <212> PRT
 <213> Human immunodeficiency virus type 2

<400> 5
 Leu Glu Ala Asn Ile Ser Gln Ser Leu Glu Gln Ala Gln Ile Gln Gln
 1 5 10 15
 Glu Lys Asn Met Tyr Glu Leu Gln Lys Leu Asn Ser Trp Asp Val Phe
 20 25 30
 Thr Asn Trp Leu
 35

<210> 6
 <211> 38
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 6
 Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15
 Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
 20 25 30
 Arg Tyr Leu Lys Asp Gln
 35

<210> 7
 <211> 38
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 7
 Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15
 Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu

	20	25	30
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Arg Tyr Leu Lys Asp Gln
35

<210> 8

<211> 48

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 8

Tyr	Thr	Ser	Leu	Ile	His	Ser	Leu	Ile	Glu	Glu	Ser	Gln	Asn	Gln	Gln
1				5					10					15	

Glu	Lys	Asn	Glu	Gln	Glu	Leu	Leu	Glu	Leu	Asp	Lys	Trp	Ala	Ser	Leu
		20						25					30		

Trp	Asn	Trp	Phe	Tyr	Pro	Tyr	Asp	Val	Pro	Asp	Tyr	Ala	Gly	Pro	Gly
	35						40					45			

<210> 9

<211> 18

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 9

Tyr	Thr	Ser	Leu	Ile	His	Ser	Leu	Ile	Glu	Glu	Ser	Gln	Asn	Gln	Gln
1				5					10					15	

Glu Lys

<210> 10

<211> 18

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 10

Glu	Glu	Ser	Gln	Asn	Gln	Gln	Glu	Lys	Asn	Glu	Gln	Glu	Leu	Leu	Glu
1				5					10					15	

Leu Asp

<210> 11

<211> 13

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 11

Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
1 5 10

<210> 12

<211> 7

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 12

Glu Leu Asp Lys Trp Ala Ser
1 5

<210> 13

<211> 56

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 13

Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr
1 5 10 15

Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu
20 25 30

Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
35 40 45

Asn Trp Phe Asn Ile Thr Asn Trp
50 55

<210> 14
 <211> 55
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 14
 Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu
 1 5 10 15
 Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly
 20 25 30
 Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys
 35 40 45
 Asp Gln Gln Leu Leu Gly Ile
 50 55

<210> 15
 <211> 46
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 15
 Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
 1 5 10 15
 Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
 20 25 30
 Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 16
 <211> 34
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 16

Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His
 1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
 20 25 30

Leu Leu

<210> 17

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 17

Trp Met Glu Trp Glu Arg Glu Ile Glu Asn Tyr Thr Gly Leu Ile Tyr
 1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
 20 25 30

Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 18

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 18

Trp Met Glu Trp Glu Arg Glu Ile Glu Asn Tyr Thr Gly Leu Ile Tyr
 1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
 20 25 30

Leu Leu

<210> 19

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 19

Tyr Thr Gly Leu Ile Tyr Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Asp Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 20

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 20

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr
1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 21

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 21

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr
1 5 10 15

Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu
20 25 30

Leu Leu

<210> 22

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 22

Tyr Thr Ser Glu Ile Tyr Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 23

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 23

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Asp Tyr Ile Tyr
1 5 10 15

Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln Glu Lys Asn Glu Lys Glu
20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 24

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 24

Trp Met Glu Trp Glu Arg Glu Ile Asp Asn Tyr Thr Asp Tyr Ile Tyr
1 5 10 15

Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln Glu Lys Asn Glu Lys Glu
20 25 30

Leu Leu

<210> 25

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 25

Tyr Thr Asp Tyr Ile Tyr Asp Leu Leu Glu Lys Ser Gln Thr Gln Gln
1 5 10 15

Glu Lys Asn Glu Lys Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 26

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 26

Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15

Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30

Leu Leu Ala Leu Asp Lys Trp Gln Asn Leu Trp Ser Trp Phe
35 40 45

<210> 27

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 27

Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr

1 5 10 15
 Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
 20 25 30

Leu Leu

<210> 28

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 28

Tyr Thr Gly Ile Ile Tyr Arg Leu Leu Glu Glu Ser Gln Asn Gln Gln
 1 5 10 15
 Glu Asn Asn Glu Lys Asp Leu Leu Ala Leu Asp Lys Trp Gln Asn Leu
 20 25 30

Trp Ser Trp Phe
 35

<210> 29

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 29

Trp Met Glu Trp Glu Arg Glu Ile Ser Asn Tyr Thr Gly Leu Ile Tyr
 1 5 10 15
 Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln Glu Lys Asn Glu Lys Asp
 20 25 30

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 30

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 30

Trp Met Glu Trp Glu Arg Glu Ile Ser Asn Tyr Thr Gly Leu Ile Tyr
1 5 10 15

Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln Glu Lys Asn Glu Lys Asp
20 25 30

Leu Leu

<210> 31

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 31

Tyr Thr Gly Leu Ile Tyr Asp Leu Ile Glu Glu Ser Gln Ile Gln Gln
1 5 10 15

Glu Lys Asn Glu Lys Asp Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 32

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 32

Trp Met Glu Trp Gln Lys Glu Ile Ser Asn Tyr Ser Asn Glu Val Tyr
1 5 10 15

Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Gly
20 25 30

Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
35 40 45

<210> 33

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 33

Trp Met Glu Trp Gln Lys Glu Ile Ser Asn Tyr Ser Asn Glu Val Tyr
1 5 10 15

Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Gly
20 25 30

Leu Leu

<210> 34

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 34

Tyr Ser Asn Glu Val Tyr Arg Leu Ile Glu Lys Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Gly Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 35

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 35

Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gln Gln Ile Tyr
1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
20 25 30

Leu Leu Ala Leu Asp Asn Trp Ala Ser Leu Trp Thr Trp Phe
 35 40 45

<210> 36

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 36

Trp Ile Gln Trp Asp Arg Glu Ile Ser Asn Tyr Thr Gln Gln Ile Tyr
 1 5 10 15

Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Asp
 20 25 30

Leu Leu

<210> 37

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 37

Tyr Thr Gln Gln Ile Tyr Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
 1 5 10 15

Glu Lys Asn Glu Gln Asp Leu Leu Ala Leu Asp Asn Trp Ala Ser Leu
 20 25 30

Trp Thr Trp Phe
 35

<210> 38

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 38

Trp Met Glu Trp Asp Arg Gln Ile Asp Asn Tyr Thr Glu Val Ile Tyr

1	5	10	15
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Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln Glu Gln Asn Glu Gln Asp
 20 25 30

Leu Leu Ala Leu Asp Lys Trp Asp Ser Leu Trp Asn Trp Phe
 35 40 45

<210> 39

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 39

Trp Met Glu Trp Asp Arg Gln Ile Asp Asn Tyr Thr Glu Val Ile Tyr
 1 5 10 15

Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln Glu Gln Asn Glu Gln Asp
 20 25 30

Leu Leu

<210> 40

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 40

Tyr Thr Glu Val Ile Tyr Arg Leu Leu Glu Leu Ser Gln Thr Gln Gln
 1 5 10 15

Glu Gln Asn Glu Gln Asp Leu Leu Ala Leu Asp Lys Trp Asp Ser Leu
 20 25 30

Trp Asn Trp Phe
 35

<210> 41

<211> 47

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 41

Trp Ile Gln Trp Glu Arg Glu Ile Asn Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15

Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30

Leu Leu Ala Leu Asp Lys Trp Thr Asn Leu Trp Asn Trp Phe Asn
35 40 45

<210> 42

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 42

Trp Ile Gln Trp Glu Arg Glu Ile Asn Asn Tyr Thr Gly Ile Ile Tyr
1 5 10 15

Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln Glu Asn Asn Glu Lys Asp
20 25 30

Leu Leu

<210> 43

<211> 37

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 43

Tyr Thr Gly Ile Ile Tyr Ser Leu Ile Glu Glu Ala Gln Asn Gln Gln
1 5 10 15

Glu Asn Asn Glu Lys Asp Leu Leu Ala Leu Asp Lys Trp Thr Asn Leu
20 25 30

Trp Asn Trp Phe Asn
35

<210> 44

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 44

Trp Gln Gln Trp Asp Glu Lys Val Arg Asn Tyr Ser Gly Val Ile Phe
1 5 10 15

Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln Asn Thr Asn Glu Lys Ser
20 25 30

Leu Leu Glu Leu Asp Gln Trp Asp Ser Leu Trp Ser Trp Phe
35 40 45

<210> 45

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 45

Trp Gln Gln Trp Asp Glu Lys Val Arg Asn Tyr Ser Gly Val Ile Phe
1 5 10 15

Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln Asn Thr Asn Glu Lys Ser
20 25 30

Leu Leu

<210> 46

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 46

Tyr Ser Gly Val Ile Phe Gly Leu Ile Glu Gln Ala Gln Glu Gln Gln
1 5 10 15

Asn Thr Asn Glu Lys Ser Leu Leu Glu Leu Asp Gln Trp Asp Ser Leu
20 25 30

Trp Ser Trp Phe

35

<210> 47

<211> 46

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 47

Trp Gln Glu Trp Asp Arg Gln Ile Ser Asn Ile Ser Ser Thr Ile Tyr
1 5 10 15

Glu Glu Ile Gln Lys Ala Gln Val Gln Gln Glu Gln Asn Glu Lys Lys
20 25 30

Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile Trp Asn Trp Leu
35 40 45

<210> 48

<211> 34

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 48

Trp Gln Glu Trp Asp Arg Gln Ile Ser Asn Ile Ser Ser Thr Ile Tyr
1 5 10 15

Glu Glu Ile Gln Lys Ala Gln Val Gln Gln Glu Gln Asn Glu Lys Lys
20 25 30

Leu Leu

<210> 49

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 49

Ile Ser Ser Thr Ile Tyr Glu Glu Ile Gln Lys Ala Gln Val Gln Gln
1 5 10 15

Glu Gln Asn Glu Lys Lys Leu Leu Glu Leu Asp Glu Trp Ala Ser Ile
20 25 30

Trp Asn Trp Leu
35

<210> 50

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 50

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40 45

<210> 51

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 51

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Ile Leu
35

<210> 52

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 52

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
35 40 45

<210> 53

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 53

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 54

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 54

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
20 25 30

Arg Tyr Leu Arg Asp Gln
35

<210> 55

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 55

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln Arg Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Gly Asp Gln
35 40 45

<210> 56

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 56

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln Arg Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 57

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 57

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln Arg Met Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Gly Asp Gln
35

<210> 58
 <211> 45
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 58
 Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
 35 40 45

<210> 59
 <211> 36
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 59
 Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Arg Val Leu
 35

<210> 60
 <211> 38
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 60
 Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu
 1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
 20 25 30

Arg Tyr Leu Arg Asp Gln
 35

<210> 61

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 61

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu Ala Ile Glu Arg Tyr Leu Arg Asp Gln
 35 40 45

<210> 62

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 62

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu
 35

<210> 63

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 63

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Ile Glu
20 25 30

Arg Tyr Leu Arg Asp Gln
35

<210> 64

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 64

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Ser Tyr Leu Lys Asp Gln
35 40 45

<210> 65

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 65

Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 66

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 66

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15
Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30
Ser Tyr Leu Lys Asp Gln
35

<210> 67

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 67

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15
Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30
Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Gln Asp Gln
35 40 45

<210> 68

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 68

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15
Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30
Ala Arg Val Leu
35

<210> 69

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 69

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Gln Asp Gln
35

<210> 70

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 70

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Leu Glu Arg Tyr Leu Arg Asp Gln
35 40 45

<210> 71

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 71

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu
 35

<210> 72

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 72

Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Leu Glu
 20 25 30

Arg Tyr Leu Arg Asp Gln
 35

<210> 73

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 73

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Gln Ala
 1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Val Lys Gln Leu Gln
 20 25 30

Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
 35 40 45

<210> 74

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 74

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln His Met Leu Gln Leu Thr Val Trp Gly Val Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 75

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 75

Ser Asn Leu Leu Arg Ala Ile Gln Ala Gln Gln His Met Leu Gln Leu
1 5 10 15

Thr Val Trp Gly Val Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Lys Asp Gln
35

<210> 76

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 76

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Lys Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Lys Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
35 40 45

<210> 77

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 77

Ser Gly Ile Val Gln Gln Gln Ser Asn Leu Leu Lys Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Lys Leu Thr Val Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Arg Val Leu
35

<210> 78

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 78

Ser Asn Leu Leu Lys Ala Ile Glu Ala Gln Gln His Leu Leu Lys Leu
1 5 10 15

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
20 25 30

Arg Tyr Leu Lys Asp Gln
35

<210> 79

<211> 45

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 79

Ser Gly Ile Val Gln Gln Gln Asn Ile Leu Leu Arg Ala Ile Glu Ala
1 5 10 15

Gln Gln His Leu Leu Gln Leu Ser Ile Trp Gly Ile Lys Gln Leu Gln
20 25 30

Ala Lys Val Leu Ala Ile Glu Arg Tyr Leu Arg Asp Gln
35 40 45

<210> 80
 <211> 36
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 80
 Ser Gly Ile Val Gln Gln Gln Asn Ile Leu Leu Arg Ala Ile Glu Ala
 1 5 10 15
 Gln Gln His Leu Leu Gln Leu Ser Ile Trp Gly Ile Lys Gln Leu Gln
 20 25 30
 Ala Lys Val Leu
 35

<210> 81
 <211> 38
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 81
 Asn Ile Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
 1 5 10 15
 Ser Ile Trp Gly Ile Lys Gln Leu Gln Ala Lys Val Leu Ala Ile Glu
 20 25 30
 Arg Tyr Leu Arg Asp Gln
 35

<210> 82
 <211> 45
 <212> PRT
 <213> Human immunodeficiency virus type 1

<220>
 <221> UNSURE
 <222> (25) .. (25)

<223> May be any amino acid

<400> 82

Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln Gln Leu Leu Arg Leu Ser Xaa Trp Gly Ile Arg Gln Leu Arg
20 25 30

Ala Arg Leu Leu Ala Leu Glu Thr Leu Leu Gln Asn Gln
35 40 45

<210> 83

<211> 35

<212> PRT

<213> Human immunodeficiency virus type 1

<220>

<221> UNSURE

<222> (25)..(25)

<223> May be any amino acid

<400> 83

Lys Gly Ile Val Gln Gln Gln Asp Asn Leu Leu Arg Ala Ile Gln Ala
1 5 10 15

Gln Gln Gln Leu Leu Arg Leu Ser Xaa Trp Gly Ile Arg Gln Leu Arg
20 25 30

Ala Arg Leu
35

<210> 84

<211> 38

<212> PRT

<213> Human immunodeficiency virus type 1

<220>

<221> UNSURE

<222> (18)..(18)

<223> May be any amino acid

<400> 84

Asp Asn Leu Leu Arg Ala Ile Gln Ala Gln Gln Gln Leu Leu Arg Leu
1 5 10 15

Ser Xaa Trp Gly Ile Arg Gln Leu Arg Ala Arg Leu Leu Ala Leu Glu
20 25 30

Thr Leu Leu Gln Asn Gln
35

<210> 85

<211> 36

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 85

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 86

<211> 31

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 86

Tyr Thr Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln
1 5 10 15

Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe
 20 25 30

<210> 87

<211> 51

<212> PRT

<213> Artificial Sequence

<220>

<223> Epitope tagged P-18 from HIV-1

<400> 87

Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln
 1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
 20 25 30

Trp Asn Trp Phe Gly Gly Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
 35 40 45

Gly Pro Gly
 50